Technical Information

88-Analog to Digital/ Digital to Analog Converter (88-AD/DA)

Another new option has been added to the growing line of Altair 8800 series peripherals. The 88-AD/DA is an eight channel analog I/O subsystem, allowing the acquisition and digitizing of analog data ranging from 0 to 10 VDC. Digital to analog conversion produces a 0 - 10 VDC output available in 256 steps of 39 millivolts. With the 88-AD/DA, the Altair 8800 microcomputer can measure analog voltages and generate them to eight bit accuracy.

Applications

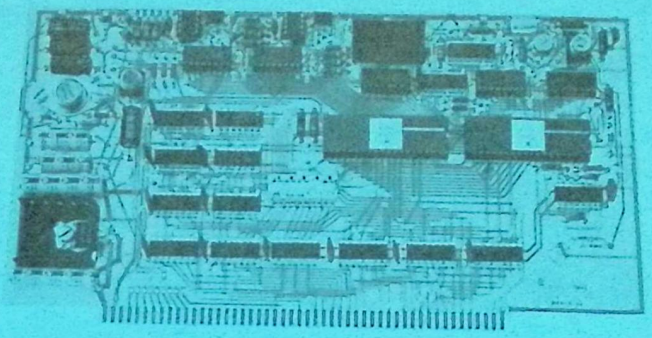
The versatility of the 88-AD/DA allows user implementation for many applications where analog to digital and digital to analog conversion is necessary. 88-AD/DA operation may be implemented for computer control, graphics production, games, scientific/electronic experimentation and monitoring.

Some suggested inputs and sources from which data can be obtained include joysticks (games, remote control, graphics), transducers (light, pressure, temperature), magnetic tape and instrumentation amplifiers (biomedical, chemical, circuit and acoustical analysis).

Oscilloscopes, magnetic recorders, meters and music synthesizers (voltage controlled oscillator, voltage controlled filter) are just some of the output devices to which data transfer is possible.

Operation

The 88-AD/DA Converter is an analog subsystem that functions as an Input/ Output (I/O) device. Analog data is input to an eight channel Multiplexer and converted to a digital equivalent value by a successive approximation type Analog-to-Digital Converter. Sample and Hold is provided to insure accurate conversions even for rapidly changing signals, and on-board timing is available to control sequencing of the Sample and Hold and Successive Approximation Register. From the time the Multiplexer has a valid address, 10 to 12 μs must elapse before the conversion data is available to the system. The conversion time for the Analog-to-Digital Converter itself, without settling time allowed for the Sample and Hold, is less than 5 μs.



The 88-AD/DA Converter board contains two Digital-to-Analog Converters that may be used to provide low cost analog output. The conversion time for each converter is limited only by the slew rate. The slew rate of the Digital-to-Analog Converters is adjustable with an on-board feedback capacitor to a maximum rate of approximately 50v per μs. The 88-AD/DA Converter board features 8 bit resolution for both A to D or D to A sections.

Specifications

AD Section

Input Mux Channels: 8

Resolution: 8 bits

Monotonicity: 8 bits

Sample and Hold Settle Time: 5 μsec.

Conversion Time: 5 μsec.

Time from Start Conversion to conversion complete: 11 μsec.

Nominal Input Range: 0-10 VDC (39mV per step)

DA Section

DA Converters: 2

Resoultion: 8 bits

Monotonicity: 8 bits

Settle Time: 85ns (50v/μsec)

Nominal Output Range: 0-10 VDC (39 mV per step)

Power Requirements

+ 18V unregulated at 45mA

- 18V unregulated at 47mA

+ 8V unregulated at 450mA

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